WHAT IS CLAIMED IS:

1. An apparatus for promoting a nuclear fusion reaction between ions, said apparatus comprising:

a reacting surface comprising at least one protrusion extending therefrom, wherein said protrusion comprises at least one apex.

2. The apparatus of Claim 1, wherein said reacting surface and said at least one protrusion are constructed from a material comprising an affinity for the ions to preload within lattice interstices thereof.

3. The apparatus of Claim 2, wherein said at least one apex of said at least one protrusion functions as an active lattice site electron concentrator within the presence of electrons and a potential applied across said reacting surface, wherein the electrons are supplied via an electron source.

4. The apparatus of Claim 3, wherein the applied potential across said reacting surface and said at least one protrusion results in the concentration or accumulation

of the electrons proximal to said at least one apex of said at least one protrusion.

5. The apparatus of Claim 4, wherein accumulation of the electrons proximal to said at least one apex of said at least one protrusion provides the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned proximal to said at least one apex of said at least one protrusion, thereby permitting fusion between same.

6. The apparatus of Claim 5, wherein nuclear fusion between at least two of the ions provides the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promotes a self-sustaining nuclear fusion reaction.

7. The apparatus of Claim 4, wherein accumulation of the electrons proximal to said at least one apex of said at least one protrusion provides the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned at

said at least one apex of said at least one protrusion, thereby permitting fusion between same.

8. The apparatus of Claim 7, wherein nuclear fusion between at least two of the ions provides the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promotes a self-sustaining nuclear fusion reaction.

9. The apparatus of Claim 1, wherein said reacting surface comprises a plurality of protrusions extending therefrom, wherein each protrusion of said plurality of protrusions comprises at least one apex.

10. The apparatus of Claim 1, wherein the ions are deuterium ions.

11. The apparatus of Claim 1, wherein the ions are tritium ions.

12. The apparatus of Claim 1, wherein the ions are deuterium ions and tritium ions.

13. The apparatus of Claim 1, wherein the ions are ions of atomic elements having higher atomic numbers than isotopic hydrogen.

14. The apparatus of Claim 1, wherein said reacting surface and associated said at least one protrusion are constructed as an ultra-thin membrane on a heat exchanger, wherein fusion energy release by the nuclear reaction is siphoned-off as heat through said reacting surface and into said heat exchanger for subsequent conversion into electricity.

15. An apparatus for promoting a nuclear fusion reaction between ions, said apparatus comprising:

a reacting surface comprising at least one cone extending therefrom.

16. The apparatus of Claim 15, wherein said reacting surface and said at least one cone are constructed from a material comprising an affinity for the ions to preload within lattice interstices thereof.

17. The apparatus of Claim 16, wherein a tip of said at least one cone functions as an active lattice site electron concentrator within the presence of electrons and a potential applied across said reacting surface, wherein the electrons are supplied via an electron source.

18. The apparatus of Claim 17, wherein the applied potential across said reacting surface and said at least one cone results in the concentration or accumulation of the electrons proximal to said tip of said at least one cone.

19. The apparatus of Claim 18, wherein accumulation of the electrons proximal to said tip of said at least one cone provides the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned proximal to said tip of said at least one cone, thereby permitting fusion between same.

20. The apparatus of Claim 19, wherein nuclear fusion between at least two of the ions provides the requisite reaction ignition for promoting and producing subsequent

nuclear fusion reactions between additional ions, and thus promotes a self-sustaining nuclear fusion reaction.

21. The apparatus of Claim 18, wherein accumulation of the electrons proximal to said tip of said at least one cone provides the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned at said tip of said at least one cone, thereby permitting fusion between same.

22. The apparatus of Claim 21, wherein nuclear fusion between at least two of the ions provides the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promotes a self-sustaining nuclear fusion reaction.

23. The apparatus of Claim 15, wherein said reacting surface comprises a plurality of cones extending therefrom.

24. The apparatus of Claim 15, wherein the ions are deuterium ions.

25. The apparatus of Claim 15, wherein the ions are tritium ions.

26. The apparatus of Claim 15, wherein the ions are deuterium ions and tritium ions.

27. The apparatus of Claim 15, wherein the ions are ions of atomic elements having higher atomic numbers than isotopic hydrogen.

28. The apparatus of Claim 15, wherein said reacting surface and associated said at least one cone are constructed as an ultra-thin membrane on a heat exchanger, wherein fusion energy release by the nuclear reaction is siphoned-off as heat through said reacting surface and into said heat exchanger for subsequent conversion into electricity.

29. An apparatus for promoting a nuclear fusion reaction between ions, said apparatus comprising:

a reacting surface comprising at least one wedge extending therefrom.

30. The apparatus of Claim 29, wherein said reacting surface and said at least one wedge are constructed from a material comprising an affinity for the ions to preload within lattice interstices thereof.

31. The apparatus of Claim 30, wherein an apex of said at least one wedge functions as an active lattice site electron concentrator within the presence of electrons and a potential applied across said reacting surface, wherein the electrons are supplied via an electron source.

32. The apparatus of Claim 31, wherein the applied potential across said reacting surface and said at least one wedge results in the concentration or accumulation of the electrons proximal to said apex of said at least one wedge.

33. The apparatus of Claim 32, wherein accumulation of the electrons proximal to said apex of said at least one wedge provides the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned proximal to said apex of

said at least one wedge, thereby permitting fusion between same.

34. The apparatus of Claim 33, wherein nuclear fusion between at least two of the ions provides the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promotes a self-sustaining nuclear fusion reaction.

35. The apparatus of Claim 32, wherein accumulation of the electrons proximal to said apex of said at least one wedge provides the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned at said apex of said at least one wedge, thereby permitting fusion between same.

36. The apparatus of Claim 35, wherein nuclear fusion between at least two of the ions provides the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promotes a self-sustaining nuclear fusion reaction.

37. The apparatus of Claim 29, wherein said reacting surface comprises a plurality of wedges extending therefrom.

38. The apparatus of Claim 29, wherein the ions are deuterium ions.

39. The apparatus of Claim 29, wherein the ions are tritium ions.

40. The apparatus of Claim 29, wherein the ions are deuterium ions and tritium ions.

41. The apparatus of Claim 29, wherein the ions are ions of atomic elements having higher atomic numbers than isotopic hydrogen.

42. The apparatus of Claim 29, wherein said reacting surface and associated said at least one wedge are constructed as an ultra-thin membrane on a heat exchanger, wherein fusion energy release by the nuclear reaction is siphoned-off as heat through said reacting surface and into

said heat exchanger for subsequent conversion into electricity.

43. A method of promoting a nuclear fusion reaction between ions, said method comprising the step of:

a. obtaining a reacting surface comprising at least one protrusion extending therefrom, wherein said protrusion comprises at least one apex.

44. The method of Claim 43, further comprising the step of preloading the ions within lattice interstices of said reacting surface and associated said at least one protrusion.

45. The method of Claim 44, further comprising the step of applying a potential across said reacting surface and associated said at least one protrusion within the presence of electrons, wherein the electrons are supplied via an electron source.

46. The method of Claim 45, wherein said step of applying a potential across said reacting surface and said at least one protrusion results in the concentration or

accumulation of the electrons proximal to said at least one apex of said at least one protrusion.

47. The method of Claim 46, further comprising the step of permitting the electrons accumulated proximal to said at least one apex of said at least one protrusion to provide the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned proximal to said at least one apex of said at least one protrusion, thereby permitting fusion between same.

48. The method of Claim 47, further comprising the step of permitting nuclear fusion between at least two of the ions to provide the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promote a self-sustaining nuclear fusion reaction.

49. The method of Claim 46, further comprising the step of permitting the electrons accumulated proximal to said at least one apex of said at least one protrusion to provide the requisite net charge density sufficient to

shield the positively-charged repulsive forces of at least two of the ions positioned at said at least one apex of said at least one protrusion, thereby permitting fusion between same.

50. The method of Claim 49, further comprising the step of permitting nuclear fusion between at least two of the ions to provide the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promote a self-sustaining nuclear fusion reaction.

51. The method of Claim 43, wherein said reacting surface comprises a plurality of protrusions extending therefrom, wherein each protrusion of said plurality of protrusions comprises at least one apex.

52. The method of Claim 43, wherein the ions are deuterium ions.

53. The method of Claim 43, wherein the ions are tritium ions.

54. The method of Claim 43, wherein the ions are deuterium ions and tritium ions.

55. The method of Claim 43, wherein the ions are ions of atomic elements having higher atomic numbers than isotopic hydrogen.

56. The method of Claim 43, wherein said reacting surface and associated said at least one protrusion are constructed as an ultra-thin membrane on a heat exchanger.

57. The method of Claim 56, further comprising the step of capturing fusion energy released by the nuclear fusion reaction via siphoning-off the fusion energy as heat through said reacting surface and into said heat exchanger for subsequent conversion of the heat into electricity.

58. A method of promoting a nuclear fusion reaction between ions, said method comprising the step of:

a. obtaining a reacting surface comprising at least one cone.

59. The method of Claim 58, further comprising the step of preloading the ions within lattice interstices of said reacting surface and associated said at least one cone.

60. The method of Claim 59, further comprising the step of applying a potential across said reacting surface and associated said at least one cone within the presence of electrons, wherein the electrons are supplied via an electron source.

61. The method of Claim 60, wherein said step of applying a potential across said reacting surface and said at least one cone results in the concentration or accumulation of the electrons proximal to a tip of said at least one cone.

62. The method of Claim 61, further comprising the step of permitting the electrons accumulated proximal to said tip of said at least one cone to provide the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions

positioned proximal to said tip of said at least one cone, thereby permitting fusion between same.

63. The method of Claim 62, further comprising the step of permitting nuclear fusion between at least two of the ions to provide the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promote a self-sustaining nuclear fusion reaction.

64. The method of Claim 61, further comprising the step of permitting the electrons accumulated proximal to said tip of said at least one cone to provide the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned at said tip of said at least one cone, thereby permitting fusion between same.

65. The method of Claim 64, further comprising the step of permitting nuclear fusion between at least two of the ions to provide the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions

between additional ions, and thus promote a self-sustaining nuclear fusion reaction.

66. The method of Claim 58, wherein said reacting surface comprises a plurality of cones.

67. The method of Claim 58, wherein the ions are deuterium ions.

68. The method of Claim 58, wherein the ions are tritium ions.

69. The method of Claim 58, wherein the ions are deuterium ions and tritium ions.

70. The method of Claim 58, wherein the ions are ions of atomic elements having higher atomic numbers than isotopic hydrogen.

71. The method of Claim 58, wherein said reacting surface and associated said at least one cone are constructed as an ultra-thin membrane on a heat exchanger.

72. The method of Claim 71, further comprising the step of capturing fusion energy released by the nuclear fusion reaction via siphoning-off the fusion energy as heat through said reacting surface and into said heat exchanger for subsequent conversion of the heat into electricity.

73. A method of promoting a nuclear fusion reaction between ions, said method comprising the step of:

a. obtaining a reacting surface comprising at least one wedge.

74. The method of Claim 73, further comprising the step of preloading the ions within lattice interstices of said reacting surface and associated said at least one wedge.

75. The method of Claim 74, further comprising the step of applying a potential across said reacting surface and associated said at least one wedge within the presence of electrons, wherein the electrons are supplied via an electron source.

76. The method of Claim 75, wherein said step of applying a potential across said reacting surface and said at least one wedge results in the concentration or accumulation of the electrons proximal to an apex of said at least one wedge.

77. The method of Claim 76, further comprising the step of permitting the electrons accumulated proximal to said apex of said at least one wedge to provide the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned proximal to said apex of said at least one wedge, thereby permitting fusion between same.

78. The method of Claim 77, further comprising the step of permitting nuclear fusion between at least two of the ions to provide the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promote a self-sustaining nuclear fusion reaction.

79. The method of Claim 76, further comprising the step of permitting the electrons accumulated proximal to

said apex of said at least one wedge to provide the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two of the ions positioned at said apex of said at least one wedge, thereby permitting fusion between same.

80. The method of Claim 79, further comprising the step of permitting nuclear fusion between at least two of the ions to provide the requisite reaction ignition for promoting and producing subsequent nuclear fusion reactions between additional ions, and thus promote a self-sustaining nuclear fusion reaction.

81. The method of Claim 73, wherein said reacting surface comprises a plurality of wedge.

82. The method of Claim 73, wherein the ions are deuterium ions.

83. The method of Claim 73, wherein the ions are tritium ions.

84. The method of Claim 73, wherein the ions are deuterium ions and tritium ions.

85. The method of Claim 73, wherein the ions are ions of atomic elements having higher atomic numbers than isotopic hydrogen.

86. The method of Claim 73, wherein said reacting surface and associated said at least one wedge are constructed as an ultra-thin membrane on a heat exchanger.

87. The method of Claim 86, further comprising the step of capturing fusion energy released by the nuclear fusion reaction via siphoning-off the fusion energy as heat through said reacting surface and into said heat exchanger for subsequent conversion of the heat into electricity.

88. A method of promoting a nuclear fusion reaction, said method comprising the step of:

a. utilizing electrons to provide the requisite net charge density sufficient to shield the positively-charged repulsive forces of at least two reacting nuclei to permit fusion between same, and thereby ignite subsequent fusion

reactions to promote and produce a self-sustaining nuclear fusion reaction.

89. An apparatus for promoting a nuclear fusion reaction, said apparatus comprising:

at least one structure having a geometrically-enhanced shape, wherein said structure comprises a net charge density to facilitate electron shielding of positively-charged repulsive forces of at least two reacting nuclei.

90. A method of promoting a nuclear fusion reaction, said method comprising the step of:

a. forming a charged surface, wherein a plurality of electrons proximate to said charged surface are utilized to shield positively-charged repulsive forces of at least two reacting nuclei.

91. A nuclear fusion system, comprising:

at least one surface having a geometrically-enhanced surface;

means for introducing a plurality of electrons proximate to said at least one surface; and

a nuclei fuel source proximal said at least one surface,

wherein said electron introducing means generates a net charge density proximate to said surface, and wherein said electrons serve to shield positively-charged repulsive forces of at least two reacting nuclei of said nuclei fuel source.

92. A system for promoting nuclear fusion reaction, said system comprising:

a reacting surface;

an electrically neutral plane in proximity to said reacting surface;

a reaction fuel disposed between said reacting surface and said electrically neutral plane; and,

an electrical potential difference between said reacting surface and said electrically neutral plane sufficient to promote the nuclear fusion reaction.

93. A system for promoting nuclear fusion reaction, said system comprising:

a reacting surface comprising at least one protrusion extending therefrom, wherein said protrusion comprises at least one apex;

an electrically neutral plane in proximity to said reacting surface;

a reaction fuel disposed between said reacting surface and said electrically neutral plane; and,

an electrical potential difference between said reacting surface and said electrically neutral plane sufficient to promote the nuclear fusion reaction.

94. An apparatus for promoting a nuclear fusion reaction, said apparatus comprising:

a reacting surface in the form of at least one sharply-pointed protrusion.

95. An apparatus for promoting a nuclear fusion reaction, said apparatus comprising:

a reacting surface in the form of at least one protrusion comprising at least one apex.